HOME ECONOMICS

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VIII. INORGANIC CONSTITUENTS OF FOODS

In deciding upon the kind and amount of food necessary to sustain the bodily functions, we should expect to find in the composition of the body itself a clew to our labyrinth of possibilities. Food in its province as a builder of tissue must be able to supply all the elements present in the body, and it must be able to supply them in a form in which they can be utilized. Food, therefore, must not only contain the sixteen or more elements that enter into the make-up of the body, such as carbon, hydrogen, oxygen, nitrogen, sulphur, phosphorus, and calcium, but it must contain these in the combination in which they exist in the body, or in a form that can easily be changed into such a combination.

The following has been given as the approximate composition of the body of an adult of average weight:

	Pounds	Pounds
Mineral matter		11
Water in bones	5	
Water in blood	9	
Water in muscle	50	
Water in other tissues	44	
Total water		108
Proteid in bones	6	
Proteid in blood	2½	
Proteid in muscle	16¼	
Proteid in other tissues	5	
Total proteid		29¾
Fat		5
Carbohydrate		¼
Total		154

These proportions by no means indicate the amounts in which these different food principles are to be supplied, for a certain amount of food must always be utilized as fuel, and the work to be performed will largely determine the amount of fuel needed. Even with the food principles whose chief or only function is that of building material the proportions necessary will be only very roughly suggested, the daily excre-

tion from the body rather than the amount present in it being the determining factor.

In the case of water the amount required in the daily diet is commensurate with that in the body. A little more than about two-thirds of the body is water, and the water required daily is approximately two-thirds the total amount of food, or from four to six pints. This may be taken in the form of tea or coffee, in juicy fruits, such as oranges and grapes, in milk, and much of it even in foods that we ordinarily think of as dry, such as meat and bread.

The uses of this large amount of water are many. It acts as a cleansing agent, and is as necessary for this purpose to the interior of the body as to the exterior. Water is often called the universal solvent, and in this capacity it is very important. Only substances in solution can pass through the intestinal walls, and the soluble proteids and carbohydrates (in the form of sugar) are dissolved in water in order to enter the circulation. It is quite probable that the fats are saponified in the intestine and dissolved in water also, instead of passing the intestinal wall in the form of an emulsion, as has been supposed. Water acts as a carrier, both conveying the food to the tissues and the waste matter from them.

If a little ether or alcohol be put into the palm of the hand and allowed to evaporate the hand becomes very cold. This illustrates the use of water as a regulator of the heat of the body. Constant evaporation is going on from the skin, and the increase or lessening of the amount of this evaporation cools the body with greater or less rapidity.

Mineral matter is present in the body chiefly in the form of lime salts and of compounds of sodium, potassium, magnesium, and iron, as phosphates, sulphates, carbonates, and chlorides. Nearly all of our foods contain mineral matter in some form. This remains as ash if we burn off the organic constituents of flour or of milk or of almost any other article of diet. The exact part that these mineral salts play in the metabolism of the body is still obsure in some respects. One function is very evident, since the bones are so largely built of this material. The mineral salts also aid in forming the digestive juices, and probably help in the solution of certain substances less soluble in water alone than in water containing salts. Whatever may be their whole work in the body, they are certainly so necessary to life that death would ensue in about a month if they were entirely cut out of the diet.